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# Patient satisfaction and quality of life following bariatric and small incision laparoscopic surgery: A systematic review

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## ABSTRACT

**Background:** The global obesity pandemic is still getting worse. The only effective treatment for morbid obesity that produces significant and long-lasting weight loss, the resolution of obesity-related comorbidities, and long-term improvement in quality of life is bariatric surgery. **Method:** A search was conducted between 2015 and 2023 through PubMed, Scopus, and Google Scholar for studies that examined quality of life, or patient satisfaction, as an outcome measure in patients who had undergone bariatric surgery of any kind and were following up for at least six years. The study excluded data on weight loss that was not consistently reported or study findings unrelated to quality of life or patient satisfaction. **Results:** According to Grönroos et al., (2021) increased weight loss was associated with improved QoL. Mean DSQoL scores after 7 years significantly improved as compared with baseline, in contrast to median HRQoL ratings. The 2017 study by De-Jong and Hinnen, (2017) demonstrates that further therapies are required to improve postoperative adherence to behavioural instructions. Ten years after the surgery, patients' overall mental health, neuroticism, and fear of intimacy all showed a discernible fall from their pre-operative levels, according to a 2016 study by (Canetti et al., 2016). At the end of the follow-up, participants in Askari et al., (2020) study reported feeling better, exercising more, and developing healthier eating habits. **Conclusion:** Improved QoL was linked to increased weight loss, and bariatric surgery produced a significant long-term improvement in QoL. Postoperative adherence to behavioural guidelines and psychosocial functioning need adjunctive therapy.

**Keywords:** Bariatric surgery, quality of life, patients satisfaction, weight loss

## 1. INTRODUCTION

Obesity is linked to a lower quality of life and a higher chance of developing chronic and non-communicable diseases like cardiovascular disease, type 2 diabetes, musculoskeletal disorders and certain malignancies. Over 650 million adults over the age of 18 are obese globally (with BMI more than or equal 30), according to the WHO. Patients with severe obesity can benefit greatly from bariatric surgery as a kind of treatment. Bariatric surgery leads to significant excess weight loss (EWL) and remission of obesity-related comorbidities, such as type 2 diabetes mellitus, when compared to medication treatment (Buchwald et al., 2009). Additionally affordable is bariatric surgery; most studies show its cost savings after a few years (Wang et al., 2013).

Using general QoL tools like the Gastrointestinal Quality of Life questionnaire, health related QoL or the Short-Form 36 (SF-36), numerous studies have documented increases in quality of life following bariatric surgery (Arcila et al., 2002; Mabey et al., 2021). Even with these encouraging results, concerns about quality of life following bariatric surgery persist. According to a number of studies, individuals recuperating from bariatric surgery are more likely to engage in self-harming activities and have depressed symptoms (Backman et al., 2016). According to a recent study by Bhatti et al., (2016) the number of self-harm events following bariatric surgery increased from 2.33 to 3.63 per 1000 patient-years. These results don't seem to match the improvement in quality of life that bariatric surgery usually brings about for patients. Further, it is unknown whether factors after bariatric surgery predict a higher quality of life.

According to Steffen et al., (2012) study about the predictors of satisfaction post bariatric surgery the individuals' biggest complaints about their skin were related to the thigh, waist and abdomen areas. The waist and belly were the most often contoured areas. Lower contentment with excess skin was independently correlated with a higher BMI at survey completion, and the desire for contouring was predicted by the amount of time that had passed since surgery. In this research, we attempted investigate predictors of a greater patient-reported quality of life (QoL) after bariatric surgery, as well as to characterise QoL and satisfaction among these patients.

## 2. METHOD

The PRISMA guidelines' recommendations were followed when conducting the study. A thorough search of Google Scholar, Scopus, and PubMed was done. We identified all published papers looking at QOL as an outcome metric in patients following any kind of bariatric surgery. The terms "English" (language) and "publication date between 2015 and 2023" were used to set the search parameters. For human patients undergoing bariatric treatment, the review included all retrospective, prospective cross sectional, randomized clinical, and observational studies that followed patients with obesity and evaluated QOL and related parameters (satisfaction, social relationships, etc.) as outcome measures at least 6 years after the procedure. The study excluded the reporting of weight reduction or postgraduate studies results that were inconsistent and unrelated to quality of life. Bariatric surgery, satisfaction, quality of life and patients follow up for longer than 6 years were the search terms used to find the data.

Excluded were case studies, review articles, and articles without available full text. All records were found through searches of the electronic databases in the first phase, and duplicates were eliminated. The abstracts and titles of the 261 discovered publications were independently examined by all authors to find possibly relevant studies during the second step, then articles that might be eligible were chosen for full-text examination. Ultimately, we searched the reference lists of the previously chosen papers produced additional publications. After debate, disagreements were settled by accord. Selected articles were read in full text by all authors and data collection was performed using a predesigned Google form and Google sheet which contain (citation, year of publication, participant's characteristics, inclusion criteria, method, main findings and conclusion) with access for all authors to avoid information missing or duplication.

## 3. RESULTS

In our search we initially collected 318 articles from the selected databases, after removal of duplication and abstract and title review, we yield 37 full text articles which were assessed for eligibility criteria and finally 6 full text articles including 1119 patients were enrolled in the review (Figure 1). Of the included studies 2 were conducted in USA Nguyen et al., (2018), Mabey et al., (2021), one in Finland Grönroos et al., (2021), one in Netherlands De-Jong and Hinnen, (2017), one in Israel Canetti et al., (2016) and one in UK Askari et al., (2020) (Table 1). Thirty-four individuals from a weight-loss programme and thirty-six bariatric surgery patients had their HRQOLs compared one and ten years following the intervention by (Canetti et al., 2016). The SF-36 was used to measure HRQOL. The

respondents also finished the Shapiro Control Inventory, the Neuroticism Scale of the NEO Five-Factor Inventory, the Mental Health Inventory (MHI) and the Fear of Intimacy Scale.

Following the surgery, both mental component score and physical component score values greatly improved in the first year and then significantly declined in years 1 through 10. While the mental component score values returned to the baseline level at the end of the follow-up period, the physical component score values remained considerably higher than they were prior to the surgery. 197 patients with BMIs ranging from 35 to 60 kg/m<sup>2</sup> participated in a randomised clinical trial by Nguyen et al., (2018) to compare the results of laparoscopic gastric banding with laparoscopic gastric bypass. Using the SF-36, HRQOL was one of the outcome measures. Ten years of follow-up were spent with the study participants.

The SF-36 scores considerably improved from the baseline in all eight domains, regardless of the operation type; both groups also showed significant increases in mental and physical score components. Askari et al., (2020) recently examined HRQOL at least ten years following laparoscopic RYGB using BAROS. Of the 104 patients who received laparoscopic RYGB throughout the study period and completed follow-up of 130 months, 92 were included in the analysis. Most study participants had baseline BMIs more than 40 kg/m<sup>2</sup>. Participants reported feeling overall better at the conclusion of the follow-up period, increasing their physical activity, being better able to work, having more satisfying social connections, and adopting a healthier eating habit.

However, there was no discernible shift in the sexual pleasure ratings. A positive outcome was reported by over half of the patients (53.2%), while others rated the RYGB results as fair (26%) or failure (20%). Mabey et al., (2021) examined the mediators of suicidality in 205 severely obese people who did not receive surgical treatment and 131 patients who were treated for RYGB 12 years later. The research findings indicate that patients receiving bariatric treatment had increased suicidality at the 12-year mark. This was attributed to a decrease in improvements in both the mental and physical aspects of the SF-36. These results provide additional support for HRQOL monitoring following bariatric surgery (Table 2).

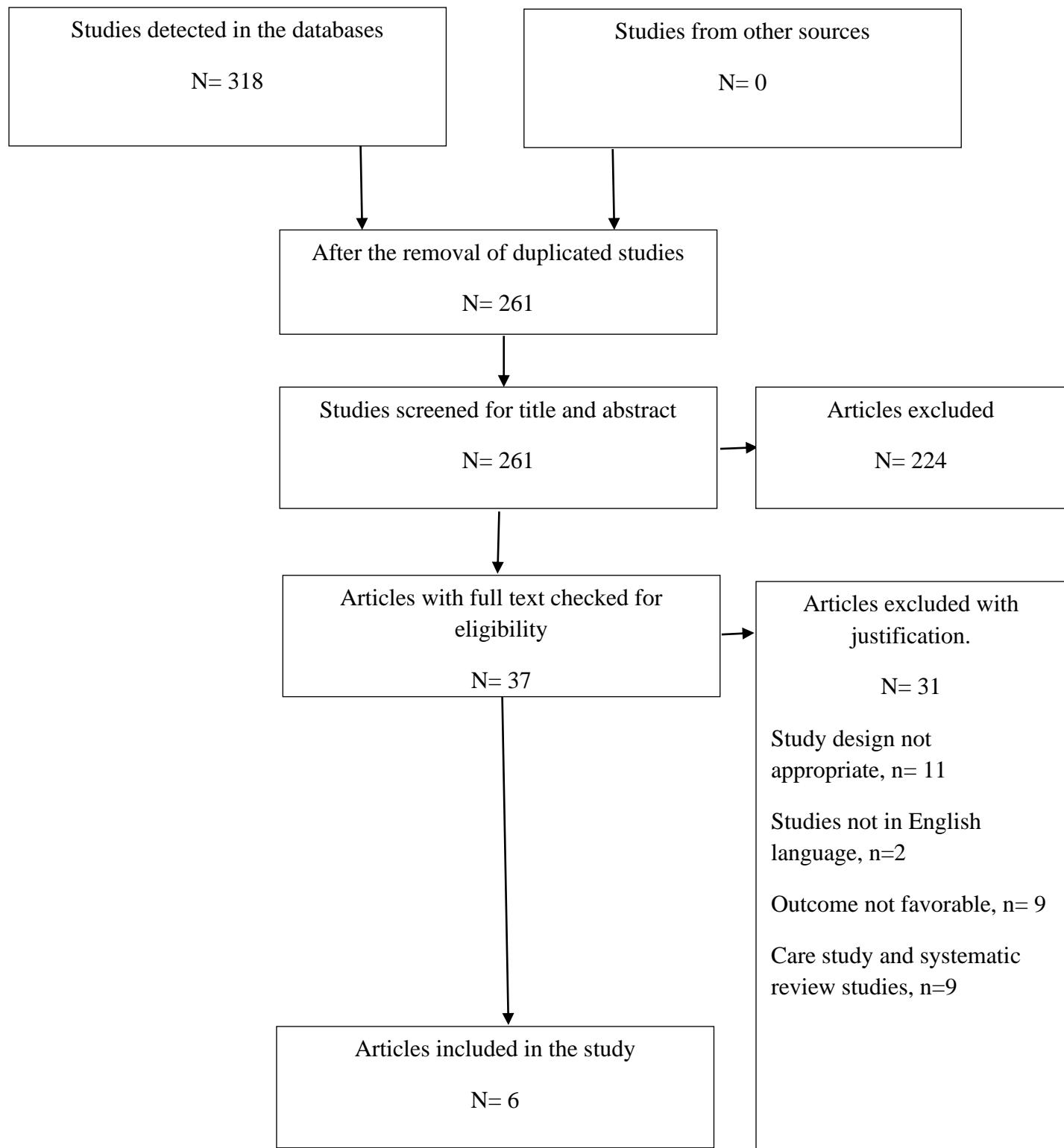


Figure 1 Consort chart of study selection

**Table 1** Characteristics of included studies

Citation	Country	Number of patients	Patients characteristics and Inclusion criteria	Method
Grönroos et al., 2021	Finland	240	There were 69.6% females, participants were 48.4 years of age on average, with a mean baseline BMI of 45.9 individuals with morbid obesity between the ages of 18 and 60 who were randomly assigned to receive LRYGB or LSG with a follow-up of seven years	Randomized trial
De-Jong and Hinnen, 2017	Netherlands	184	Adult patients who were between the ages of 18 and 24 who had undergone bariatric surgery between 6- and 74-months prior were included.	Patients contacted for phone interviews and sent questionnaires measuring postoperative weight, QoL, and lifestyle choices, such as following a diet.
Canetti et al., 2016	Israel	Surgery group= 34 Dietary group= 36	34 individuals in a weight reduction programme and 36 patients undergoing bariatric surgery were weighed and evaluated at each of the three intervals.	The mental health questionnaire, neuroticism, sense of control, and intimacy fear scores were given to the participants. In addition to these assessments of the mind and body, the medical outcome short form (SF-36) was employed.
Nguyen et al., 2018	USA	197	Patients with BMIs from 35 to 60 (kg/m) were randomized to either laparoscopic banding or laparoscopic gastric bypass surgery.	Following exclusions, 86 individuals had gastric banding and 111 patients had gastric bypass surgery. Multiple logistic regressions were used to analyse the factors that were predictive of improved weight reduction.
Askari et al., 2020	UK	92	Authors included patients who had LRYGB and completed follow-up of 130 months. BMI in 85.9% of the population was greater	Information was gathered from a prospective database on the patient's demographics, QoL, weight, type of surgery,

			than 40, and the median age was 48.	comorbidities, BMI, and complications.
Mabey et al., 2021	USA	336	Twelve years after surgery, 131 patients' suicidality was assessed by the investigators in comparison to 205 severely obese patients who did not undergo surgery.	Suicidality was evaluated in relation to changes in metabolic health and HRQOL. The Suicide Behaviours Questionnaire-Revised was used to measure suicidality. HRQOL and metabolic health were evaluated at baseline, two, and six years.

**Table 2** Main findings and conclusion of selected studies

Citation	Main findings	Conclusion
Grönroos et al., 2021	After LSG, the %EWL mean was 47%, and after LRYGB, it was 55%. At 7 years, the median HRQoL total score was 0.87 after LRYGB and 0.88 after LSG, while the mean DSQoL total score was 0.50 after LSG and 0.49 after LRYGB. Improved DSQoL was linked to greater weight loss. In contrast to median HRQoL ratings (LSG, 0.88 vs. 0.87; and LRYGB, 0.87 vs. 0.85), mean DSQoL scores after 7 years considerably improved when compared with baseline (LSG, 0.50 vs. 0.10) and LRYGB, 0.49 vs. 0.12. For LSG, the overall morbidity rate was 24.0%, and for LRYGB, it was 28.6%.	In terms of EWL percentage at 7 years post-operative LSG, and LRYGB were not comparable. More weight was lost with LRYGB, but no clinically significant difference according to the predetermined equivalency margins. The long-term DSQoL improvement following bariatric surgery was significant, and no difference was detected in QoL between the methods. Improved DSQoL was linked to greater weight loss.
De-Jong and Hinnen, 2017	For LSG, the mean percent weight loss was 30.2; for LRYGB, it was 35.6. Following postoperative dietary guidelines became less common over time ( $r = -.25$ ), which accounted for 8.3% of the variation in weight loss. QoL scores were mostly unrelated to weight loss and fell short of the national averages for young people. It was found that 25% of patients had no formal education, employment, or training, and 38% had sought mental health	Following bariatric surgery, young adult patients lose weight in a manner similar to that of adult patients. Adjunctive therapies are necessary to increase postoperative adherence to behavioural instructions and psychosocial functioning, as they both clearly show areas for development.

	assistance since their operation. These statistics were unrelated to weight loss and were associated with a lower Qol.	
Canetti et al., 2016	After ten years, the surgical group's weight loss results were successful, and their health-related Qol scores were higher than baseline. After ten years, however, there was a noticeable decline in their overall mental health, sense of control, neuroticism, and fear of intimacy scores when compared to their pre-operative levels. Throughout all three times in time, the members of the dietary group maintained their psychological stability.	This study emphasises how crucial it is to pinpoint a risk group within bariatric patients, for whom nutritional and psychological follow-up may be very important.
Nguyen et al., 2018	The average age and BMI at baseline were 43 years old and 46.5 kg/m <sup>2</sup> , respectively. The cohort as a whole lost an average of -37.5 kg at the 10-year follow-up, with a gastric bypass causing a weight loss of -42.4 kg and a gastric banding causing a weight loss of -27.4 kg. After gastric banding, the rate of late reoperation was much higher than the group that underwent gastric bypass. Among the cohort as a whole, 68% experienced improvement or remission from diabetes, 61% from hypertension, and 57% from dyslipidemia. At follow-up mean of 9.5 years, the cohort's long-term mortality was 1.0%. Both groups' Qol has continued to improve from the baseline at the long-term follow-up.	For severely obese patients, bariatric surgery is a successful treatment that results in a 10-year weight loss that is sustainable and improves Qol and comorbidities. When compared to gastric banding, gastric bypass was linked to increased comorbidity remission, a decreased late reoperation rate, and superior long-term weight loss.
Askari et al., 2020	The EWL median was 46.5%. Obstructive sleep apnea decreased from 12.0% compared to 33.7 preoperatively, hypertension decreased from 51 to 39%, and diabetes mellitus type 2 from 56 to 23%. At the conclusion of the follow-up, participants reported	At more than 10 years follow-up, LRYGB produces favourable results in terms of decreased comorbidities weight loss, and an increase in Qol.

	getting more exercise, feeling better, being able to work more efficiently, having more fulfilling social interactions, and adopting a healthier eating habit.	
Mabey et al., 2021	Compared to the nonsurgery group, the surgery group had a greater suicide rate. In the univariate models, only the SF-36 Physical Component Summary at two years post-surgery and the indirect pathways for the SF-36 Mental Component Summary were significant.	Bariatric surgery patients had greater rates of suicidality at 12 years. This was mediated by a lesser degree of recovery in the psychological and physical aspects of HRQOL during the first two years following surgery, indicating the necessity for further clinical follow-up.

#### 4. DISCUSSION

This systematic analysis shows that bariatric surgery improves quality of life (QoL) and reduces comorbidities in weight reduction among individuals with obesity. It also suggests that a higher degree of weight loss is associated with an improvement in QoL. Bariatric surgery presents potential to boost psychosocial development and quality of life (QoL) in the face of the risks that morbid obesity represents to completing psychosocial developmental goals like finding love and job (Mayseless and Keren, 2013). We were unable to monitor changes in quality of life prior to and during surgery due to the lack of a baseline measure. QoL seems to be falling behind when comparing postsurgery SF-36 scores to national averages for young adults (Aaronson et al., 1998). Following surgical dietary instructions seemed to be associated with better weight loss. Individuals who had lower adherence rates showed considerably less weight loss; 8.3% of the variation in the mean percent weight loss could be explained by adherence.

Even though the sample as a whole had just sufficient nutritional adherence, 25% of patients reported inadequate adherence, and many patients reported engaging in bad lifestyle practices. Patients who had surgery more recently had reduced adherence rates, suggesting issues with long-term dietary regimen compliance (Sarwer et al., 2011; Jenkins et al., 2011). NEET status was associated with lower quality of life on both the physical and mental levels, considering its relationship with all SF-36 scales. It appears that progress in enhancing psychosocial functioning and quality of life remains to be made. It appears that weight loss surgery is not enough to address this. According to Manco et al., (2017), patients with LSG had a significant improvement in their overall quality of life score. At the study's conclusion, significant gains were seen in the domains of social, emotional, and physical functioning.

Similar results were seen in O'Brien et al., (2010)'s randomised control experiment, where gains were noted in family activities, general health, physical functioning, and self-esteem. Super-obese and morbidly obese patients in the Holterman et al., (2012) study showed significant improvements in their assessments of their physical, mental, and overall well-being. Hervieux et al., (2016) found that there has been a notable improvement in the quality-of-life assessments, particularly in the domains of physical and psychological health. Grönroos et al., (2021) study reports that, when compared to the baseline, there was a notable long-term improvement in DSQoL following LRYGB and LSG. Up to five years following both surgeries, HRQoL was higher than baseline; however, by seven years, HRQoL fell to baseline levels. Despite the improvement brought about by bariatric surgery, the HRQoL of the trial participants remained worse at baseline and for the duration of the follow-up than the HRQoL of the age- and sex-standardized general Finnish population.

The relationship between weight loss and QoL was also shown by Grönroos et al., (2021) study; more weight reduction was associated with improved DSQoL. Numerous research Hachem and Brennan, (2016), Cooiman et al., (2019) have documented the beneficial impact of bariatric surgery on overall quality of life (QoL). However, there is a dearth of long-term QoL studies that evaluate all DSQoL and HRQoL categories. Given that the general population without obesity also experience aging-related phenomena, prospective differences in the mean age of the patients could account for some of the observed disparities in long-term HRQoL degradation following bariatric surgery (Sintonen, 2001). Prior research evaluating the various QoL dimensions noted similarities

between long-term DSQoL and HRQoL following LRYGB and LSG (Versteegden et al., 2018; Major et al., 2015). Although QoL outcomes do not appear to be impacted by the type of operation, this still needs to be evaluated in terms of the weight reduction outcome and sustainability, especially at longer-term follow-up.

## 5. CONCLUSION

Increased weight loss was associated with improved QoL. Bariatric surgery resulted in a considerable long-term improvement in QoL. Adjunctive therapy is required to improve postoperative adherence to behavioural instructions and psychosocial functioning.

### Abbreviations

EWL: Excess weight loss

LRYGB: Laparoscopic Roux-en-Y gastric bypass

HRQOL: Health-Related Quality of Life

LSG: Laparoscopic Sleeve Gastrectomy

DSQOL: Diabetes-specific quality of life scale

QoL: Quality of life

BMI: Body mass index

NEET: Not in Education, Employment, or Training

### Ethical approval

Not applicable

### Funding

This study has not received any external funding.

### Conflict of interest

The authors declare that there is no conflict of interests.

### Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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